MATH 286 PROBLEMS DUE APRIL 11, 2001

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1. Calculate

$$\begin{pmatrix} 1 & 1 & 0 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 2 & 0 \\ 1 & 0 & 1 & 0 \end{pmatrix}^{-1}.$$

2. Does $Ax = 0$ have a non-zero solution, where

$$A = \begin{pmatrix} 2 & 1 & 0 & 1 \\ 1 & 2 & 1 & 0 \\ 0 & 1 & 2 & 1 \\ 1 & 0 & 1 & 2 \end{pmatrix}?$$

3. Find the eigenvalues and eigenvectors of

$$\begin{pmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 4 & 3 & 0 \end{pmatrix}.$$

4. Solve:

$$\begin{array}{rcrcrcr} y_1' & = & 3y_1 & + & 2y_2 & + & 2y_3 \\ y_2' & = & y_1 & + & 4y_2 & + & y_3 \\ y_3' & = & -2y_1 & - & 4y_2 & - & y_3. \end{array}$$

5. Find the general solution of

$$y' = \begin{pmatrix} 2 & -10 \\ 1 & 1 \end{pmatrix} y.$$